UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,178	02/13/2004	Michael Philip Fitton	248773US2CRL	4471

22850 7590 08/06/2008

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
TAYONG, HELENE E	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
08/06/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/777,178	FITTON ET AL.	
	Examiner	Art Unit	
	HELENE TAYONG	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-15 and 17-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-15 and 17-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/23/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. The request filled on 5/7/08 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 10777178 is acceptable and RCE has been established. An action on the RCE follows.

Response to Arguments

2. (1) **with regards to Claim Rejections - 35 USC § 101**

Applicant's argument regarding the rejection of claim 14, "a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer's program's functionality to be realized, [is] thus statutory" have been fully considered and are persuasive. The rejection of claim 14 under *35 USC § 101* has been withdrawn.

(2) Applicants arguments regarding the rejection of claims 1-3, 7-8, 10-11, 13, 15-17, and 19-20 under 35 U.S.C. § 103(a) as unpatentable over U.S. patent 5,563,909 to Nakazawa (herein "Nakazawa '909") in view of U.S. patent 5,710,977 to Nakazawa (herein "Nakazawa '977") have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 7-8, 10, 13-15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (APA) (fig. 1b) in view of Takashi (JP2001148647) (see IDS).

(1) with regards to claims 1, 7, 10, 14, 15;

APA discloses in (fig. 1b) an antenna branch selector (124) for selecting for processing at least one of a plurality of antenna branches (122) each coupled to a respective receive antenna (122) and carrying a received signal (input to 124), said antenna branch selector (pages 2-3) comprising:

a signal selector (124) having a plurality of inputs (inputs from 122) to receive signals from said plurality of antenna branches(122) and having an output to output a selected signal (126) for processing (128);

a controller (138) coupled to RSSI measurement, 128) and to said signal selector (124) to control (input from 138, 140 page 3, lines 2-4) said signal selector (124) to select an antenna branch (122) from said plurality of antenna branches (122).

APA discloses all of the subject matter discussed above, but for specifically teaching

(a) a time-to-frequency domain converter configured to receive a time domain signal from each of said plurality of antenna branches and to provide a corresponding frequency domain output signal; and

(b) a controller is responsive to a difference between a signal level at a first frequency and a signal level at a second frequency in a frequency domain output signal for an antenna branch.

(i) with regards to item (a) above;

However, Takashi in the same endeavor (diversity receiver) discloses in (figs.6) a FFT, 214a) circuit in a frequency characteristic evaluation method (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the RSSI measurement unit of APA with the FFT circuit as taught by Takashi in order to analyze the signal's spectrum from the selector for the benefit of speed and accurate selection.

(ii) with regards to item (b) above;

However, Takashi in the same endeavor (diversity receiver) discloses in (fig.6 an identifier circuit, 215a) that counts the number of energy of the subcarrier exceeding a threshold and the antenna of high counted value is selected as the antenna in the best reception state (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the comparator unit of APA with the circuit as taught by Takashi in order to select a signal for the antenna branches for the benefit of speed and accurate selection.

(2) with regards to claim 8;

APA further discloses wherein said controller (138 and 140) is further configured to determine an indication of received power (RSSI is an indication of the power level being received by the antenna, 128) for a said antenna branch, and

said controller (138) is further configured to select said antenna branch (124) from said plurality of antenna branches (122) responsive to said received power indication (128) (fig. 1b and pages 2-3).

(3) with regards to claim 13;

APA further discloses a receiver (fig.1b) including the antenna branch selector (124) of claim 1 (pages 2-3).

(4) with regards to claim 19;

APA discloses determining a measure of received signal strength for each received signal (APA fig. 1a, 104) from each antenna (102) from said plurality of antennas (104) using frequency domain transformed signal, wherein said selecting (106) is further responsive to said determined measure of received signal strength (fig. 1a)

APA discloses all of the subject matter discussed above, but for specifically teaching using frequency domain transformed signal.

(i) with regards to item (a) above;

However, Takashi in the same endeavor (diversity receiver) discloses in (figs.6) a FFT, 214a) circuit in a frequency characteristic evaluation method (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the RSSI measurement unit of APA with the

FFT circuit as taught by Takashi in order to analyze the signal's spectrum from the selector for the benefit of speed and accurate selection. () with regards to claim 20;

determining a measure of received signal to noise and/or interference ratio, for the signal from each said antenna from said frequency domain transformed signal and wherein said selecting is further responsive to said determined measure of received signal to noise and/or interference ration.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art(APA) (fig. 1b) in view of Takashi (JP2001148647) (see IDS) as applied in claim 1 above, and further in view of Laroia et al. (US 6920192).

(1) Regarding claim 4;

(APA) as modified by Takashi discloses all of subject matter as described above except for specifically teaching wherein said received signal corresponding to said selected antenna branch has, in the frequency domain, at least two tones, and wherein said first and second frequencies comprise frequencies of said at least two tones.

However, Laroia et al. in the same field of endeavor, teaches wherein a said received signal has, in the frequency domain, at least two tones, and wherein said first and second frequencies comprise frequencies of said tones (fig. 4, col. 5, lines 1-5 and col. 4, lines 64-67).

In cellular wireless systems with adaptive antenna arrays, the multiple antenna of the array are typically deployed at the base station of each cell, and the signals transmitted or received by the antennas are linearly combined with certain complex

weights. By properly adjusting the antenna weights, the multiple antennas can improve signal-to interference ratio (SIR) and receive diversity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize frequencies of tones of Laroia et al's in the branch selector of (APA) as modified by Takashi to reduce interference in cellular wireless systems. The motivation to utilize Laroia et al's frequencies of tones in the branch selector of (APA) as modified by Takashi was to provide frequency diversity.

6. Claims 5, 6,17 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art(APA) (fig. 1b) in view of Takashi (JP2001148647) (see IDS) and Laroia et al. (US 6920192) as applied in claim 4 above, and further in view of Wilkinson (4606047).

(1) Regarding claims 5,17 and 18;

(APA) as modified by Takashi and Laroia et al. discloses all of subject matter as described above except for specifically teaching wherein said received signal comprises a packet data signal including a preamble signal portion, and wherein said tones comprise tones of said preamble signal portion.

However, Wilkinson in the same field of endeavor, teaches wherein said received signal comprises a packet data signal including a preamble signal portion, and wherein said tones comprise tones of said preamble signal portion (fig. 3, col5, lines 12-26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for transmitting and receiving radio frequencies

signals, frequency selective fading and intersymbol interference can occur across the high frequency band because of ionoshheric induced variations in multipath propagation. To overcome the undesirable effects of multipath propagation, appropriate signal processing before and after transmission can be done by using packet data signals with preambles. The motivation to utilize Wilkinson's signals in the system of (APA) as modified by Takashi was to improve on received signal quality.

(2) with regards to claim 6;

APA further discloses wherein said received signal corresponding to said selected antenna branch (fig. 1b) comprises a Bluetooth compatible signal (page 3, last paragraph).

7. Claims 9, 11, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art(APA) (fig. 1b) in view of Takashi (JP2001148647) (see IDS) and Wilkinson (4606047) as applied in claims 1,15 and 17 above, and further in view Kishimoto et al(7035612 B2).

(1) Regarding claim 9;

APA as modified by Takashi discloses all of subject matter as described above except for specifically teaching wherein said controller is further configured to select said antenna branch responsive to a difference between signal levels in said frequency domain signal for an antenna branch at a third frequency comprising a frequency of said received signal and at a fourth frequency comprising a frequency at which substantially no signal level from said received signal is expected.

However, Kishimoto et al. in the same field of endeavor, teaches wherein said controller is further configured to select a said antenna branch responsive to a difference between signal levels in said frequency domain signal for an antenna branch at a third frequency comprising a frequency of said received signal and at a fourth frequency comprising a frequency at which substantially no signal level from said received signal is expected (fig. 5 step 10-16 col. 9, lines 25-47 and col. 11, lines 53-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize frequency difference of Kishimoto et al's with the system APA as modified by Takashi in order to improve communications performance by increasing the affinity between frequency hopping and antenna diversity communications. The motivation to utilize Kishimoto et al.'s frequency difference instead of APA as modified by Takashi and Wilkinson would be to improve on transmission and reception quality.

(2) Regarding claims 11 and 21;

APA as modified by Takashi and Wilkinson discloses all of the subject matter discussed above, but for specifically teaching wherein said packet data signal includes a payload portion and said method further comprising monitoring a received signal indicator during reception of said payload portion and selecting a received signal responsive to said monitoring.

However, Kishimoto et al in the same field of endeavor, teaches wherein said packet data signal includes a payload portion and further comprising monitoring a

received signal indicator during reception of said payload portion and selecting a received signal responsive to said monitoring (col. 2, lines 58-63)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for transmitting and receiving radio frequencies signals, frequency selective fading and intersymbol interference can occur across the high frequency band because of ionoshheric induced variations in multipath propagation. To overcome the undesirable effects of multipath propagation, appropriate signal processing before and after transmission can be done by using packet data signals with preambles. The motivation to utilize Kishimoto et al's packet data signal that includes a payload portion would be to improve on received signal quality and check for transmission errors.

(2) Regarding claim 22;

APA as modified by Takashi and Wilkinson discloses all of subject matter as described above except for specifically teaching wherein monitoring a received signal frequency change parameter, wherein said selecting of the received signal responsive to said monitoring is responsive to said frequency change parameter.

However, Kishimoto et al in the same field of endeavor, teaches wherein said packet data signal includes a payload portion and further comprising monitoring a received signal indicator during reception of said payload portion and selecting a received signal responsive to said monitoring (col. 2, lines 58-63)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for transmitting and receiving radio frequencies

signals, frequency selective fading and intersymbol interference can occur across the high frequency band because of ionoshheric induced variations in multipath propagation. To overcome the undesirable effects of multipath propagation, appropriate signal processing before and after transmission can be done by using packet data signals with preambles. The motivation to utilize Kishimoto et al's packet data signal that includes a payload portion would be to improve on received signal quality and check for transmission errors.

8. Claims 12, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (APA) (fig. 1b) in view of Takashi (JP2001148647) (see IDS) and Kishimoto et al(7035612 B2) as applied in claim 11 above and further in view of Boer et al. (US 6967994 B2).

(1) Regarding claims 12, 23 and 24;

APA as modified by Takashi and Kishimoto et al discloses all of subject matter as described above except for specifically teaching

(a) means for selecting said received signal responsive to a received signal parameter measured during said preamble signal;

(b) means for determining a Doppler frequency change of said received signal; and

(c) means for reselecting said received signal during said payload signal conditional upon said determined Doppler frequency change being greater than a threshold frequency change.

(i) Regarding item (a)

Boer et al. in the same field of endeavor, teaches means for a received signal parameter measured during said preamble signal (col.2, lines 44-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Boer et al.'s received signal parameter measured during said preamble signal to the system of APA as modified by Takashi and Kishimoto et al in order to provide the receiver with quality measure signal. The motivation to utilize Boer et al's received signal parameter measured during said preamble signal instead of those of APA as modified by Takashi and Kishimoto et al would be to provide quality detection at the receiver end and hence increase throughput of data transmission.

(ii) Regarding item (b)

Boer et al. in the same field of endeavor, teaches means for determining a Doppler frequency change of said received signal (col.2, lines 48-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Boer et al.'s received signal parameter measured during said preamble signal to the system of APA as modified by Takashi and Kishimoto et al in order to provide the receiver with quality measure signal. The motivation to utilize Boer et al's Doppler frequency change of said received signal instead of those of APA as modified by Takashi and Kishimoto et al would be to provide quality detection at the receiver end and hence increase throughput of data transmission.

(iii) Regarding item (c)

Boer et al. in the same field of endeavor, teaches means for reselecting said

received signal during said payload signal conditional upon said determined frequency change being greater than a threshold frequency change (col.3, lines 36-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of Boer et al. with the system of APA as modified by Takashi and Kishimoto et al in order to determine what the propagation conditions of channel will be and for a benefit of improving detection quality.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art(APA) (fig. 1b) in view of Takashi (JP2001148647) (see IDS) as applied in claim 15 above, and further in view of Nakazawa (US 5563909).

(1) Regarding claim 20;

APA as modified by Takashi discloses all of the subject matter discussed above, but for specifically teaching determining a measure of received signal to noise and/or interference ratio for each received signal from each antenna from said plurality of antennas using frequency domain transformed signal wherein said selecting is further responsive to said determined measure of received signal to noise and/or interference ratio.

However, Nakazawa discloses determining a measure of received signal to noise and/or interference ratio (interpreted as propagation characteristics) for each received signal from each antenna from said plurality of antennas using frequency domain transformed signal wherein said selecting is further responsive to said determined measure of received signal to noise and/or interference ratio (col. 5, lines 57-65) and

(col. 8, lines 27-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have method of Nakazawa as taught by APA as modified by Takashi in order measure and analyze received signal wave having excellent propagation characteristics for the benefit of selecting an antenna with best quality.

10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art(APA) (fig. 1b) in view of Takashi (JP2001148647) (see IDS) and Boer et al. (US 6967994 B2) as applied in claim 24 above, and further in view Kishimoto et al(7035612 B2).

(1) Regarding claim 25;

APA as modified by Takashi and Boer et al discloses all of subject matter as described above except for specifically teaching wherein said threshold frequency change is dependent upon the duration of a said packet.

However, Kishimoto et al. in the same field of endeavor, teaches wherein said threshold frequency change is dependent upon the duration of a said packet (col. 3, lines 38-48).

Antenna diversity, is a mode in which signal fading at an antenna is reduced by using a plurality of antennas with low fading correlations. The signals from the antennas are switched to the receiver depending on the levels of signals at the antennas. To reduce the effects of fading and other propagation characteristics, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize

method of Kishimoto et al. in the system of APA as modified by Takashi and Boer et al. The motivation to combine this method would be to improve on transmission and detection quality.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Paultler et al (US 6859503) discloses a method and system in a transceiver for controller a multiple input output communication channel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HELENE TAYONG whose telephone number is (571)270-1675. The examiner can normally be reached on Monday-Friday 8:00 am to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Liu Shuwang can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Helene Tayong/
Examiner, Art Unit 2611

July 30, 2008
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611